

JAN 18 2018

JULIA C. DUDLEY, CLERK  
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UNITED STATES DISTRICT COURT  
WESTERN DISTRICT OF VIRGINIA  
ROANOKE DIVISION

UNITED STATES OF AMERICA : Criminal No. 7:17CR73  
:   
v. : Violations of  
: 18 U.S.C. §§ 287, 371, 1001,  
YIHENG PERCIVAL ZHANG and: 1343, and 1519  
ZHIGUANG ZHU :  
:

**SUPERSEDING INDICTMENT**

The Grand Jury charges that:

**Introduction**

At all times relevant to this Superseding Indictment:

1. YIHENG PERCIVAL ZHANG ("ZHANG") was a professor in the Department of Biological Systems Engineering at Virginia Tech.
2. ZHANG was the founder and Chief Scientific Officer of Cell-Free Bioinnovations, Inc. ("CFB").
3. ZHIGUANG ZHU ("ZHU") was the Chief Technology Officer of CFB, and served as Principal Investigator ("PI") on federal awards made to CFB.
4. The National Science Foundation ("NSF") is an independent agency within the executive branch of the United States Government. NSF's mission includes awarding federal funds to support all fields of fundamental science and engineering, except for medical sciences.
5. The Department of Energy ("DOE") is an independent federal agency with a mission to ensure the United States' security and prosperity by addressing energy, environmental, and nuclear challenges through transformative science and technology solutions, to include making research awards.

6. The Small Business Administration ("SBA") is an independent agency within the executive branch of the United States Government that was created by Congress in 1953 for the purpose of encouraging the development of small businesses.

7. Through Sections 9(j) and 9(p) of the Small Business Act respectively, federal law requires that the SBA issue policy directives for the operation of the set-aside Small Business Innovation Research ("SBIR") and Small Business Technology Transfer ("STTR") programs.

Government agencies with Research and Development ("R&D") budgets of \$100 million or more are required to set aside a percentage of those funds to finance the SBIR program.

Government agencies with budgets of \$1 billion or more are required to set aside a percentage of those funds to finance the STTR program.

- a. The statutory purpose of the SBIR program is: (1) to strengthen the role of innovative small businesses in federally-funded research and development; and (2) to increase competition, productivity, and economic growth.

Additional specific program objectives are to:

- i. Stimulate United States technological innovation;
- ii. Use small businesses to meet federal research and development needs;
- iii. Foster and encourage participation in technical innovation by socially and economically disadvantaged small businesses, and by small businesses that are at least 51-percent owned and controlled by women;
- iv. Increase private-sector commercialization of innovations derived from federal R&D;

- v. Promote cooperative research and development with non-profit research institutions; and
  - vi. Foster and encourage participation by socially disadvantaged businesses.
- b. The statutory purpose of the STTR program is to stimulate a partnership of ideas between innovative small businesses and research institutions through federally-funded research or R&D. Additional specific program objectives are to:
- i. Stimulate technological innovation;
  - ii. Foster technology transfer through cooperative R&D between small businesses and research institutions; and
  - iii. Increase private-sector commercialization of innovations derived from federal R&D.

8. The primary difference between the SBIR and STTR programs is that the STTR program requires a team approach, in which the small business must partner with a collaborating research institution such as a university. The research institution must receive a minimum of thirty percent (30%) of the award funds and perform a minimum of thirty percent (30%) of the research.

9. CFB utilized the SBIR and STTR funding programs managed by NSF and DOE.

10. NSF and DOE SBIR/STTR awards are divided into three phases. Phase I is a feasibility study to determine suitability for further research with regard to a particular topic. It generally lasts six to twelve months and is funded with an amount between \$70,000 and \$225,000, depending on the awarding agency. Phase II consists of expansion and development of the technology investigated in Phase I, typically lasts two years, and is funded with an amount

between \$300,000 and \$1 million. A company must submit a successful final report upon the conclusion of Phase I to be eligible for Phase II.

11. SBIR/STTR proposals and reports were required to be electronically submitted to the federal agency offering the grant opportunity. Proposals and associated reports to NSF were submitted through NSF's electronic FastLane system, for which computer servers were located in Virginia. Proposals and associated reports to DOE were electronically submitted through a system called grants.gov, which served as an electronic portal for grant proposals submitted to DOE. Computer servers for grants.gov were physically located in Virginia.

12. Generally, the federal government issues payments under the SBIR/STTR programs via electronic transfer. For example, NSF electronically requests payment through the Department of Treasury's Financial Management Service (FMS), located in Kansas City, Missouri. FMS then authorizes payment through a Federal Reserve Bank, and the money is transferred from the Federal Reserve Bank to the awardee's bank account. DOE utilizes the Automated Standard Application for Payments (ASAP) system to allow for quick and secure disbursements to awardees. The Department of the Treasury provides this service to federal agencies and their awardees. Federal agencies enroll awardees in ASAP, authorize payments, and manage awardees' accounts. Once an awardee is enrolled in ASAP, it requests payments from pre-authorized accounts. At all relevant times, federal SBIR/STTR grant award payments were electronically transferred from the associated federal agency, through the Department of Treasury, and then wired to a business bank account identified by the awardee.

13. NSF does not provide funding for work already performed; the work should be based on innovative, transformational technology. ZHANG served as an NSF reviewer in 2008 and 2009 and knew that SBIR/STTR funding is for novel technology. He reviewed one proposal and gave

it a "Poor" rating noting, "NSF does not support non-transformative research. The proposers need prove technological and economical [sic] feasibility for this "new" technology."

14. Proposals to NSF include the following language that must be certified in order to be considered for funding:

By electronically signing and submitting this proposal the Authorized Organizational Representative (AOR) or Individual Applicant is (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application... Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U.S. Code, Title 18, Section 1001).

15. Proposals to DOE include the following language that must be certified in order to be considered for funding:

By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete, and accurate to the best of my knowledge. I also provide the required assurances and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties [sic]. (U.S. Code, Title 18, Section 1001)

16. Reports to NSF include the following language that must be certified in order for the report to be approved, and for payment to be released:

I understand that the willful provision of false information or concealing a material fact in this report or any other communication submitted to NSF is a criminal offense (U.S. Code, Title 18, Section 1001).

NSF also required certified interim and final SBIR/STTR program project reports, containing the following language: "work for which payment is hereby requested was done in accordance with the award terms and conditions."

17. Federal Financial Reports to DOE include the following language that must be certified in order for the report to be approved:

By signing this report, I certify to the best of my knowledge and belief that the report is true, complete, and accurate, and the expenditures, disbursements and cash receipts are for the purposes and intent set forth in the award documents. I am aware that any false, fictitious, or fraudulent information may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001).

18. Reports entitled "Final Schedule of Costs by Element & Certification" submitted to DOE for STTR awards include the following language that must be certified in order for the report to be approved:

I certify that... a minimum of 30% of the funding, excluding any purchased or leased equipment, materials, and supplies, must be allocated to the research institution."

19. Each certified SBIR/STTR program proposal submitted to the United States Government was evaluated and scored on its own merits. Evaluators relied upon truthful representations made in the proposals and other related documents submitted to them by an applicant.

### **COUNT ONE**

The Grand Jury charges that:

1. The allegations in the Introduction are realleged and incorporated by reference.
2. From in or about January 2014 through in or about May 2016, in the Western District of Virginia and elsewhere, ZHANG, ZHU, and others conspired to (a) defraud the United States and agencies thereof in any manner and for any purpose and (b) commit offenses against the United States, that is, (1) in a matter within the jurisdiction of the executive branch of the Government of the United States, to knowingly and willfully make materially false, fictitious, and fraudulent statements and representations, in violation of Title 18, United States Code, Section 1001, (2) to knowingly cause to be made and presented claims upon and against an agency of the United States, knowing such claims to be false fictitious, and fraudulent, in violation of Title 18, United States Code, Section 287, and (3) having devised and intending to

devise a scheme to defraud and for obtaining money by means of false and fraudulent pretenses, representations, and promises, to cause to be transmitted by means of wire communication in interstate commerce, any writings, signs, and signals for the purpose of executing such scheme, in violation of Title 18, United States Code, Section 1343.

3. The purpose of the conspiracy was for CFB to receive NSF and DOE funds by fraudulently representing that grant funds would be used to fund certain research when, in fact, the funds were to be used for other purposes.

4. As part of the scheme, ZHANG and ZHU prepared and caused to be prepared materially false and fraudulent proposals for awards, subsequent reports, and related communications under the programs, including, but not limited to false and fraudulent information regarding the research to be performed under the awards, material omissions regarding ZHANG'S ongoing affiliation with Tianjin Institute of Industrial Biotechnology ("TIIB"), the adequacy of CFB's accounting and timekeeping systems, and budgeting funds for subcontractors without subsequently providing them with the budgeted funds.

5. It was further part of the scheme to defraud that ZHANG and ZHU, through false and fraudulent proposals, subsequent associated reports, and related communications under the programs, caused the United States Government to approve SBIR and STTR program awards to CFB.

6. Sugar phosphates are drugs and the precursors for drugs for the treatment of various diseases. CFB's STTR Phase I application to NSF requested funds to research a low-cost method for the production of sugar phosphates from starch. Inositol is a nutrient belonging to the vitamin B family which can promote human and animal health benefits; deficiency in inositol is linked to many diseases. CFB's SBIR Phase I applications to NSF requested funds to research a low-cost

method for the production of inositol from starch. Arabinose is a zero calorie healthy sweetener, with dual functions as a prebiotic and a sucrase inhibitor, and is used as a food additive. CFB's STTR Phase I application to DOE requested funds to research the lost-cost production of this sweetener. Enzymatic fuel cells are sugar-powered biobatteries. CFB's SBIR Phase II application to NSF requested funds to research the production of these alternative power sources.

7. To effect the objects of the conspiracy, one or more of the conspirators did various acts, including, but not limited to, the following:

a. On or about May 18, 2015, ZHANG sent an email to CFB employee DW stating:

What we expect here is to get this free money and use half of money to do what you want to do – make sweeteners. Another half will be used to pay VT graduate students to finish this project.

b. On or about June 11, 2015, ZHANG sent an email to CFB employees DW, ER, and CY stating:

Now D[W] and C[Y] are submitting NSF SBIR I (inositol) and STTR I (sugar phosphate) projects via CFB, respectively. Indeed, nearly all experiments in SBIR I (inositol) have been finished...Now we submit this SBIR proposal. If it is funded, most of SBIR I will be used for CFB to support the other projects...About sugar phosphate project, the experiments have been conducted by one of my collaborators and my satellite lab in China...If this project is funded by STTR, most of money will be used to fund the other project in CFB, too

c. On or about December 18, 2015, ZHANG sent an email to CFB employees ER and ZHU stating:

Second, the inositol project was funded by Chinese funding agency, starting in the late of 2014. We tried to let CFB to take advantage of the inositol project developed in China and raise funding to support other projects developed in CFB...Similar to the sugar phosphate project. The idea and funding of this projects occurred in China and other inventors before CFB received the NSF STTR I grant. CFB should have no right to claim this invention. The other party did a favor to CFB, but your doing



stopped any further support like this. I have clear and strong evidences pertaining to previous funding support in China for both inositol and sugar phosphate projects.

- d. On or about October 13, 2014, CFB submitted an Arabinose Proposal (DE-SC0013229) to DOE.
  - e. On or about June 16, 2015, CFB submitted an Inositol Proposal (IIP-1548815) to NSF.
  - f. On or about June 16, 2015, CFB submitted the Sugar Phosphate Proposal (IIP-1549018) to NSF.
  - g. On or about December 7, 2015, CFB submitted an Inositol Proposal (IIP-1621085) to NSF.
8. The submissions falsely represented the funds sought would be used to fund new research on certain matters, when, in fact, the funds were to be used for other purposes, and did not disclose that the work represented to be performed with grant funds had already been done. These submissions also contained materially false and fraudulent proposals for awards, subsequent reports, and related communications under the programs, including, but not limited to false and fraudulent information regarding the expenditure of funds under the awards, material omissions regarding ZHANG'S ongoing affiliation with TIIB, the adequacy of CFB's accounting and timekeeping systems, and budgeting funds for subcontractors without subsequently providing them with the budgeted funds.
9. All in violation of Title 18, United States Code, Section 371.

#### **COUNTS TWO THROUGH EIGHT**

1. The facts set forth in the Introduction and Paragraphs 4 through 8 of Count One are realleged and incorporated by reference.

2. On or about the following dates, in the Western District of Virginia and elsewhere, ZHANG and ZHU, as principals and aiders and abettors, caused knowingly and willfully materially false, fictitious, and fraudulent statements and representations to be made, in a matter within the jurisdiction of the executive branch of the Government of the United States:

<u>COUNT</u>	<u>DATE</u>	<u>REPRESENTATION MADE TO</u>
TWO	January 20, 2015	DOE (In relation to award DE-SC0013229)
THREE	June 16, 2015	NSF (In relation to proposal IIP-1548815)
FOUR	June 16, 2015	NSF (In relation to proposal IIP-1549018)
FIVE	December 7, 2015	NSF (In relation to proposal IIP-1621085)
SIX	December 16, 2015	DOE (In relation to award DE-SC0013229)
SEVEN	May 30, 2016	DOE (In relation to award DE-SC0013229)
EIGHT	May 30, 2016	NSF (In relation to award IIP-1353266)

3. On or about the dates listed below, in the Western District of Virginia and elsewhere, ZHANG and ZHU (1) were members of a conspiracy, (2) the offense of causing knowingly and willfully materially false, fictitious, and fraudulent statements and representations to be made, in a matter within the jurisdiction of the executive branch of the Government of the United States, was committed by a member of the conspiracy, (3) the offense was committed while the co-conspirator was a member of the conspiracy and (4) the offense was committed in furtherance of the conspiracy:

<u>COUNT</u>	<u>DATE</u>	<u>REPRESENTATION MADE TO</u>
TWO	January 20, 2015	DOE (In relation to award DE-SC0013229)
THREE	June 16, 2015	NSF (In relation to proposal IIP-1548815)
FOUR	June 16, 2015	NSF (In relation to proposal IIP-1549018)
FIVE	December 7, 2015	NSF (In relation to proposal IIP-1621085)
SIX	December 16, 2015	DOE (In relation to award DE-SC0013229)

SEVEN	May 30, 2016	DOE (In relation to award DE-SC0013229)
EIGHT	May 30, 2016	NSF (In relation to award IIP-1353266)

4. The submissions falsely represented the funds sought would be used to fund new research on certain matters, when, in fact, the funds were to be used for other purposes, and did not disclose that the work represented to be performed with grant funds had already been done. These submissions also contained materially false and fraudulent proposals for awards, subsequent reports, and related communications under the programs, including, but not limited to false and fraudulent information regarding the expenditure of funds under the awards, material omissions regarding ZHANG'S ongoing affiliation; with TIIB, the adequacy of CFB's accounting and timekeeping systems, and budgeting funds for subcontractors without subsequently providing them with the budgeted funds.
5. All in violation of Title 18, United States Code, Sections 2 and 1001(a)(2).

### **COUNTS NINE THROUGH ELEVEN**

The Grand Jury charges that:

1. The facts set forth in the Introduction and Paragraphs 4 through 8 of Count One are realleged and incorporated by reference.
2. On or about the following dates, in the Western District of Virginia and elsewhere, ZHANG, as a principal and aider and abettor, knowingly caused to be made and presented a claim upon and against an agency of the United States, knowing such claim to be false fictitious, and fraudulent:

<u>COUNT</u>	<u>DATE</u>	<u>CLAIM</u>
NINE	June 16, 2015	\$150,000 federal funds for Inositol Proposal for NSF SBIR Phase I Project

TEN	June 16, 2015	\$225,000 federal funds for Sugar Phosphate Proposal for NSF STTR Phase I Project
ELEVEN	December 7, 2015	\$225,000 federal funds for Inositol Proposal for NSF SBIR Phase I Project

3. On or about the dates listed below, in the Western District of Virginia and elsewhere, ZHANG was (1) a member of a conspiracy, (2) the offense of knowingly causing to be made and presented a claim upon and against an agency of the United States, knowing such claim to be false, fictitious, and fraudulent, was committed by a member of the conspiracy, (3) the offense was committed while the co-conspirator was a member of the conspiracy and (4) the offense was committed in furtherance of the conspiracy:

<u>COUNT</u>	<u>DATE</u>	<u>CLAIM</u>
NINE	June 16, 2015	\$150,000 federal funds for Inositol Proposal for NSF SBIR Phase I Project
TEN	June 16, 2015	\$225,000 federal funds for Sugar Phosphate Proposal for NSF STTR Phase I Project
ELEVEN	December 7, 2015	\$225,000 federal funds for Inositol Proposal for NSF SBIR Phase I Project

4. All in violation of Title 18, United States Code, Sections 2 and 287.

### COUNT TWELVE

The Grand Jury charges that:

1. The facts set forth in the Introduction and Paragraphs 4 through 8 of Count One are realleged and incorporated by reference.
2. From in or about August 24, 2016 through in or about September 20, 2017, in the Western District of Virginia and elsewhere, ZHANG did knowingly alter, destroy, conceal, cover up, falsify, and make false entry in a record, document, and tangible object, to wit: timesheets,

with the intent to impede, obstruct, and influence the investigation and proper administration of any matter within the jurisdiction of any department or agency of the United States and in relation to and contemplation of any such matter or case.

3. On or about June 24, 2016 and July 27, 2016, the NSF Office of Inspector General (OIG) issued Subpoena Nos. S-2016-018 and S-2016-033, respectively, to CFB for documentation related to its NSF and DOE awards, including timesheets. ZHANG provided an initial response received August 16, 2016 that included ledgers, subcontracting agreements, personnel records, a payroll summary, and leasing documents, but did not include any timesheets. On August 10, 2016 ZHANG certified to NSF OIG that the materials provided in response to the NSF OIG subpoenas were "genuine, complete and in full compliance with the demands in the subpoena." ZHANG also certified that he was authorized to make this representation on behalf of CFB. After reviewing the records produced, on November 15, 2016, NSF OIG emailed ZHANG to determine whether the timesheets requested under item 1.c.i. would be produced pursuant to the subpoenas' demands. The same day, ZHANG sent two separate email attachments, containing approximately 49 pages of timesheets.

4. During the execution of a search warrant at ZHANG'S residence on September 20, 2017, numerous additional timesheets were located that were not produced pursuant to the NSF OIG subpoenas. These additional records showed differing sets of CFB employee timesheets for the same period, including three different sets of timesheets covering the same period for two CFB employees and two different sets of timesheets covering the same period for ZHU.

5. All in violation of Title 18, United States Code, Section 1519.

**COUNTS THIRTEEN THROUGH TWENTY-FOUR**

The Grand Jury charges that:

1. The facts set forth in the Introduction and Paragraphs 4 through 8 of Count One are realleged and incorporated by reference.
2. On or about the dates set forth below, in the Western District of Virginia and elsewhere, ZHANG and ZHU, having devised and intending to devise a scheme to defraud and for obtaining money by means of false and fraudulent pretenses, representations, and promises, caused to be transmitted by means of wire communication in interstate commerce, any writings, signs, and signals for the purpose of executing such scheme.
3. On or about the dates set forth below, ZHANG and ZHU caused funds to be transferred from the United States Government to CFB, by means of interstate wire communications for the purpose of executing the scheme:

I. NSF Phase II Award IIP-1353266

<u>COUNT</u>	<u>DATE</u>	<u>AMOUNT</u>	<u>FROM/TO</u>
THIRTEEN	10-Apr-14	\$169,436	Treasury (Kansas City, MO) To CFB BB&T Account Ending 8135 (Opened in Virginia)
FOURTEEN	17-Sep-14	\$135,549	
FIFTEEN	3-Jun-15	\$135,549	
SIXTEEN	2-Jul-15	\$8,000	Treasury (Kansas City, MO) To CFB BB&T Account Ending 8046 (Opened in Virginia)
SEVENTEEN	11-Nov-15	\$135,549	
Total		\$584,083	

II. DOE Phase I Award DE-SC0013229

<u>COUNT</u>	<u>DATE</u>	<u>AMOUNT</u>	<u>FROM/TO</u>
EIGHTEEN	16-Mar-15	\$22,000	Treasury (Kansas City, MO) To CFB BB&T Account Ending 7880 (Opened in Virginia)
NINETEEN	13-Apr-15	\$20,000	
TWENTY	11-May-15	\$25,000	
TWENTY-ONE	29-Jul-15	\$20,000	
TWENTY-TWO	11-Sep-15	\$20,000	
TWENTY-THREE	7-Oct-15	\$20,000	
TWENTY-FOUR	29-Oct-15	\$22,265	
	Total	\$149,265	

4. The purpose of the scheme was for CFB to receive NSF and DOE funds by fraudulently representing that grant funds would be used to fund certain research when, in fact, the funds were to be used for other purposes.

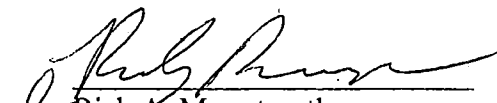
5. As part of the scheme, ZHANG and ZHU prepared and caused to be prepared materially false and fraudulent proposals for awards, subsequent reports, and related communications under the programs, including, but not limited to false and fraudulent information regarding the expenditure of funds under the awards, material omissions regarding ZHANG'S ongoing affiliation with TIIB, the adequacy of CFB's accounting and timekeeping systems, and budgeting funds for subcontractors without subsequently providing them with the budgeted funds.

6. It was further part of the scheme to defraud that ZHANG and ZHU, through false and fraudulent proposals, subsequent associated reports, and related communication under the programs, caused the United States Government to approve SBIR and STTR program awards to CFB.

7. All in violation of Title 18, United States Code, Section 1343.

A true bill, this 18th day of January 2018.

/s/ Grand Jury Foreperson  
Grand Jury Foreperson

  
Rick A. Mountcastle  
United States Attorney